

Remarks

Favorable reconsideration of this application, in view of the above amendments and in light of the following remarks and discussion, is respectfully requested.

Claims 23, 26-28, 30-32, and 34-37 are currently pending in the application; Claims 23, 26-28, 30-32, 34, and 36 having been amended, and Claims 25 and 29 having been canceled without prejudice or disclaimer, by way of the present response.

Applicants express thanks for the Examiner's indication that Claims 28 and 31 include allowable subject matter. In response, Applicants have rewritten formerly dependent Claim 28 in independent form to recite features of independent Claim 23. Applicants have further amended newly independent Claim 28 to recite features added to independent Claim 23. As discussed below, Applicants respectfully submit herewith a terminal disclaimer to overcome obviousness-type double patenting rejections, and have amended the claims to overcome rejections under 35 U.S.C. § 112, first and second paragraphs. Thus, Applicants respectfully request the allowance of new independent Claim 28.

As stated above, Claims 23, 26, 27, 30-32, 34, and 36 have been amended. Applicants respectfully assert that support for the changes to the claims is self-evident from the originally filed disclosure, including the original claims, and that therefore no new matter has been added.¹

In the outstanding Office Action, it is asserted that the current application must contain a specific reference to PCT application no. PCT/JP98/05861. Applicants respectfully traverse

¹ With respect to independent Claim 23, please see, for example, dependent Claims 25 and 29, now canceled without prejudice or disclaimer.

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this assertion, and respectfully assert that as the current application is a result of commencement of the national stage of PCT application no. PCT/JP98/05861 in accordance with 35 U.S.C. § 371, Applicants are not required to amend the specification to include a specific reference to the PCT application.

In the Office Action, independent Claim 23 was rejected under 35 U.S.C. § 112, first paragraph, or alternatively the specification was objected to as failing to provide proper antecedent basis for features recited in the independent claim. In response, Applicants have amended Claim 23 in a non-narrowing manner to remove the recitation of “excluding solar energy.” Thus, Applicants respectfully request that any outstanding rejection of independent Claim 23 under 35 U.S.C. § 112, first paragraph, and objection to the specification be withdrawn.

In the Office Action, Claims 23, 25-32, and 34 were rejected under 35 U.S.C. § 112, second paragraph. In response, Applicants have amended the claims in a non-narrowing manner to overcome the rejection. Specifically, Applicants have amended newly independent Claims 31 to remove the recitation of “thereby enabling a continuous operation,” and have amended dependent Claim 32 to recite “said first control valve” in place of the previous recitation of “said control valve,” in accordance with the Examiner’s helpful suggestion. Thus, Applicants respectfully request that the rejection of Claims 23, 25-32, and 34 under 35 U.S.C. § 112, second paragraph, be withdrawn.

In the Office Action, Claims 23 and 28 were rejected under the judicially created doctrine of obviousness-type double patenting over Claims 1 and 2 of U.S. Patent No. 6,391,162 to Kamiya et al. (Kamiya) in view of U.S. Patent No. 4,254,943 to Bjorkman or U.S. Patent No. 4,401,512 to Likins, Jr. (Likins). Claims 23 and 28 were rejected under the judicially created doctrine of double patenting over Claims 1 and 2 of Kamiya. In response,

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inasmuch as the rejections may be applied to the amended claims, Applicants respectfully submit herewith a terminal disclaimer in compliance with 37 C.F.R. § 1.321(c). Thus, Applicants respectfully request that the rejections of Claims 23 and 28 under the judicially created doctrine of obviousness-type double patenting be withdrawn.

In the Office Action, Claims 23, 25-27, 29, 30, 32, and 34-37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Great Britain Publication No. 819,025 to Christiansen in view of U.S. Patent No. 6,309,513 to Sephton and Likins or Bjorkman.² Applicants respectfully assert that the rejection of the claims has been overcome for the following reasons.

The present invention is directed to desalination apparatuses operated on a batch operation mode. Independent Claims 23 and 31 recite an evaporation can. A heat exchanger is placed in raw water in the evaporation can so as to subject low-temperature waste heat supplied to the heat exchanger and raw water in the evaporation can to heat exchange and generate water vapor in the evaporation can, the low-temperature waste heat being an exhaust steam from a steam turbine for electric power generation in a plant. A condenser is connected to the evaporation can to receive the water vapor from the evaporation can, and cool the water vapor by subjecting the water vapor and cooling water to heat exchange and obtain distilled water. A distilled water tank is connected to the condenser for receiving and storing the distilled water. Vacuum means are associated with the evaporation can for evacuating the evaporation can and depressurizing an inside thereof to promote generation of water vapor in the evaporation can. Raw water supply means are provided at the evaporation can for externally supplying raw

² Although page 4, lines 3-5, of the outstanding Office Action states that "Claims 23, 25-32 and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB '025 in view of Sephton (5,753,549) . . ." Applicants respectfully assert that the rejection is understood not to apply to Claims 28 and 31, which the Examiner has indicated include allowable subject matter on lines 14-16. Applicants also respectfully assert that the rejection is understood to be in view of U.S. Patent No. 6,309,513 to Sephton. Applicants respectfully assert that U.S. Patent No. 5,753,549 to Lee has not been made of record in the application, and U.S. Patent No. 5,853,549, while to Sephton, was not used in a rejection of the claims in a previous Office Action.

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water into the evaporation can, the raw water supply means including a control valve connected to the evaporation can for supplying raw water into the evaporation can. Raw water discharge means open the evaporation can to the atmosphere for discharging concentrated raw water from the evaporation can, the raw water discharge means including a second control valve for opening the evaporation can to the atmosphere. Control means control the vacuum means intermittently so that the vacuum means is operated for a predetermined period after concentrated raw water is discharged from the evaporation can, the raw water is supplied into the evaporation can and the evaporation can is closed upon starting of a desalination operation.

Christiansen is directed to a method of producing fresh water from brackish water. However, Applicants respectfully assert, and the Office Action apparently concedes, that Christiansen does not teach or suggest the claimed features of control means for controlling a vacuum means intermittently so that the vacuum means is operated for a predetermined period after concentrated raw water is discharged from an evaporation can, the raw water is supplied into the evaporation can and the evaporation can is closed upon starting of a desalination operation, as recited in independent Claim 23. Specifically, independent Claim 23 recites “control means for controlling said vacuum means intermittently so that said vacuum means is operated for a predetermined period after concentrated raw water is discharged from said evaporation can, the raw water is supplied into said evaporation can and said evaporation can is closed upon starting of a desalination operation.”

The Office Action relies on Sephton, Likins, and Bjorkman in an attempt to remedy the deficiencies of Christiansen. However, Applicants respectfully assert that none of Sephton, Likins, and Bjorkman teach or suggest the claimed features recited in independent Claim 23.

Sephton is directed to desalination of seawater by evaporation. However, Applicants respectfully assert, and the Office Action apparently concedes, that Sephton does not teach or suggest the claimed features of control means for controlling a vacuum means intermittently so

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that the vacuum means is operated for a predetermined period after concentrated raw water is discharged from an evaporation can, the raw water is supplied into the evaporation can and the evaporation can is closed upon starting of a desalination operation, as recited in independent Claim 23.

Likins is directed to batch distillation. However, Applicants respectfully assert that Likins does not teach or suggest, and the Office Action does not assert that Likins teaches or suggests, the claimed features of a desalination apparatus operated on a batch operation, and therefore also does not teach or suggest the claimed features of control means for controlling a vacuum means intermittently so that the vacuum means is operated for a predetermined period after concentrated raw water is discharged from an evaporation can, the raw water is supplied into the evaporation can and the evaporation can is closed upon starting of a desalination operation, as recited in independent Claim 23.

Bjorkman is directed to an apparatus for removing mercury from solid waste. However, Applicants respectfully assert that Bjorkman does not teach or suggest, and the Office Action does not assert that Bjorkman teaches or suggests, the claimed features of a desalination apparatus operated on a batch operation, and therefore also does not teach or suggest the claimed features of control means for controlling a vacuum means intermittently so that the vacuum means is operated for a predetermined period after concentrated raw water is discharged from an evaporation can, the raw water is supplied into the evaporation can and the evaporation can is closed upon starting of a desalination operation, as recited in independent Claim 23.

Applicants respectfully note that the desalination apparatus as recited in independent Claim 23 provides a number of advantages over the cited references. For example, the claimed apparatus includes the control means for controlling the vacuum means intermittently so that the vacuum means is operated for the predetermined period after concentrated raw water is

discharged from the evaporation can, the raw water is supplied into the evaporation can and the evaporation can is closed upon starting of the desalination operation. Thus, it is not necessary to operate the vacuum means intermittently during the desalination operation. Because it is not necessary to open the evaporation can to the atmosphere, the vacuum condition is maintained during the desalination operation. As stated in Applicant's previous response, pages 32 to 33 of the originally filed specification disclose factual evidence that the claimed desalination apparatus achieves new and unexpected result of providing a water-producing capacity of more than 40 times that of a known desalination apparatus.

The claimed apparatus also recites that a raw water supply means includes a control valve connected to the evaporation can for supplying raw water into the evaporation can, and that a raw water discharge means includes a second control valve for opening the evaporation can to the atmosphere. Thus, in the claimed apparatus, it is not necessary to use a discharge pump, for example, to supply or discharge water.

Thus, Applicants respectfully submit that the above-rejection of independent Claim 23 in view of Christiansen, Sephton, Likins, and Bjorkman is based on the improper application of hindsight considerations. It is well settled that it is impermissible simply to engage in hindsight reconstruction of the claimed invention, using Applicants' structure as a template and selecting elements from the references to fill in the gaps.³ Recognizing, after the fact, that a modification of the prior art would provide an improvement or advantage, without suggestion thereof by the prior art, rather than dictating a conclusion of obviousness, is an indication of improper application of hindsight considerations. (Underlining added). Simplicity and hindsight are not proper criteria for resolving obviousness.⁴ Further, Applicants respectfully submit that the

³ *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

⁴ *In re Warner*, 397 F.2d 1011, 154 USPQ 173 (CCPA 1967).

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“fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness.”⁵ Therefore, Applicants respectfully assert that an improper “obvious to try” rationale is being applied in the Office Action.⁶ Specifically, because none of Christiansen, Sephton, Likins, and Bjorkman teaches or suggest the desirability of the claimed features of control means for controlling a vacuum means intermittently so that the vacuum means is operated for a predetermined period after concentrated raw water is discharged from an evaporation can, the raw water is supplied into the evaporation can and the evaporation can is closed upon starting of a desalination operation, Applicants respectfully assert that the Office Action has failed to establish a *prima facie* case of obviousness, and Applicants respectfully submit that the rejection of independent Claim 23 under 35 U.S.C. § 103(a) is improper. Thus, Applicants respectfully request that the rejection of independent Claim 23 under 35 U.S.C. § 103(a) be withdrawn.

Remaining dependent Claims 26, 27, 29, 30, 32, and 34-37 are allowable for at least the same reasons as independent Claim 23, from which they depend, as well as for their own features. Thus, Applicants respectfully request that the rejection of dependent Claims 26, 27, 29, 30, 32, and 34-37 under 35 U.S.C. § 103(a) be withdrawn and the dependent claims allowed.

Regarding the objection to newly independent Claim 31, Applicants respectfully assert that the independent claim is allowable for at least the same reasons as independent Claim 23, as independent Claim 31 has been amended to recite similar features.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition

⁵ See Heading under MPEP 2143.01.

⁶ See MPEP 2145 X.B.

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for formal Allowance. A Notice of Allowance for Claims 23, 26-28, 30-32, and 34-37 is earnestly solicited.

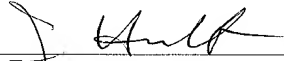
Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

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Respectfully submitted,

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